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| 09/878,923 | 06/13/2001 | Mark D. Roberts | 28549/165405 | 2854 |

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| EXAMINER |
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| TRAN, KHANH C |

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| 2631 | 16 |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. 09/878,923 | Applicant(s) ROBERTS, MARK D. | |
|---|---|---|---|
| | Examiner Khanh Tran | Art Unit 2631 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,6-18,20,21,23-35,38-44 and 47-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *11-16,29-34 and 38-43* is/are allowed.

6)☒ Claim(s) *1-3,6-10,17,18,20,21,23-28,35,44 and 47-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. The Amendment filed on 04/28/2004 has been entered. Claims 1-3, 6-18, 20-21, 23-35, 38-44, and 47-52 are pending in this Office action.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 1-3, 7-10, 17-18, 20-21, 25-28, 35, 40-44, and 49-52 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 6-10, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wingard U.S. Patent 6,295,318 B1.

Regarding claim 1, Wingard invention is directed to a method of increasing data rate of the data transmitted over a limited bandwidth medium by using a modified pulse position modulation (PPM) scheme.

Figure 2 illustrates an embodiment of a transmitting and receiving system according to Wingard invention. Input data signal 202 is encoded into a PPM

encoded output signal consisting of a series of n-bit pulses with pre-defined pulse characteristic as shown in figure 3. The foregoing corresponds to the claimed step of generating a plurality of pulse trains.

In column 4, lines 17-67, Wingard teachings discloses that each pulse has a period equal to frame length and has a preferred duty cycle of 50%. Each frame transmits a single pulse at a rate not exceeding the bandwidth and the number of frames is equal to the bandwidth of the system. Each pulse is analyzed to determine whether the pulse that is currently being transmitted is overlapped from the period of the pulse that has been transmitted previously. When overlapping occurs, the receiver is not able to resolve the individual pulses. The current pulse of the PPM encoded output signal is inverted and shifted later in time relative to its current position in its frame to eliminate the overlapping. Wingard further discloses that in the event that inversion of the current PPM encoded output signal does not eliminate the overlapping, a blank with sufficient delay is inserted between the current PPM encoded output signal and the previous PPM encoded output signal. In light of the foregoing, inserting a blank with sufficient delay to prevent pulse overlapping addresses to the claimed step of inserting a time delay between two pulse trains. Wingard does not expressly disclose the time delay resulting in as set forth in the claimed invention. As recited the blank with sufficient delay is inserted to prevent pulse overlapping, which would cause a degradation of the received signal quality at the receiver. In view of the foregoing, it would have been obvious for one of ordinary skill in the

art at the time the invention was made that the receiver would measure the received pulses to determine sufficient delay for preventing pulse overlapping. The claimed received signal quality criterion is the receiver's ability of resolving individual pulses as taught by Wingard. Furthermore, figure 3 illustrates PPM encoded output signal comprising pulse amplitude and pulse width, corresponding the claimed predetermined pulse characteristic. ***Note:*** the limitation "*wherein the time position is specified in accordance with a code element of a time-hopping code*", indicated allowable in the last Office action, is rejected in this Office action because claimed limitations has been fully addressed.

Regarding claim 2, the ability of resolving individual pulses at the receiver is inherently a threshold for determining a time delay between pulses.

Regarding claim 3, Wingard does not expressly disclose a time delay specified by at least one code element of at least one delay code. Nevertheless, Wingard teaches that insertion of a blank creates sufficient separation or delay between the two successive pulse periods so that the receiver may distinguish them. Furthermore, a blank consists of a plurality of zero-value pulses. Since a blank performs similar function as a delay code claimed in the patent application, it would have been obvious for one of ordinary skill in the art that a blank as taught by Wingard would be equivalent to a delay

code at least in its simplest form as described in the original disclosure, and each zero-value pulse also corresponds to a delay code element in its simplest form.

Regarding claim 6, as recited in claim 5, a blank includes zero-value pulses wherein each zero-value pulse specifies an amount of delay time, corresponding to a delay code element in its simplest form. Hence, a time delay is inserted between every two pulses corresponding to the claimed step of specifying time delays to be inserted between two delay code periods.

Regarding claim 7, as recited in claim 1, Wingard discloses that in the event that inversion of the current PPM encoded output signal does not eliminate the overlapping, as stated in the rejection of claim 1 although it's not explicitly taught by Wingard, the receiver make a measurement to determine if the current pulse is resolvable and inform the transmitter if more delay is needed. Depending on the amount of delay, a blank comprising a plurality of zero-value pulses is inserted so that the receiver can distinguish individual pulses. The step, as claimed, of selecting a received signal quality measurement that satisfies a received signal quality criterion would correspond to the insertion of a blank with sufficient delay so that individual pulses can be resolved at the receiver. The claimed step of delaying a pulse train by an amount of time equal to a sum of any inserted time delays that satisfy the received signal quality criterion corresponds to insertion of a blank with sufficient time delay so that the receiver distinguish individual pulses.

Regarding claim 8, as appreciated by one of ordinary skill in the art, the received signal quality measurement is a function of signal strength, signal-to-noise ratio, and signal strength.

Regarding claim 9, as recited in claim 1, pulse overlapping is determined on the basis of whether the receiver distinguishes individual pulses. In light of the foregoing, overlapping indicates signal quality measurement falls below a threshold. When that occurs, insertion of a blank with sufficient time delay adds a time delay between the two pulses.

Regarding claim 10, as recited in claim 9, when overlapping occurs, insertion of a blank with sufficient time delay alleviates overlapping between the two pulses. No overlapping satisfies the received signal quality criterion.

Regarding claim 17, as recited in claim 3, each zero-value pulse corresponds to a delay code element in its simplest form. The zero-value pulse specifies a time delay value.

4. Claims 18, 20-21, 23, 24-28, 35, 44, and 47-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee U.S. Patent 5,479,397.

Regarding claims 18 and 44, Lee discloses in the summary of the invention, column 4 lines 10-35, that in a code division multiple access (CDMA)

system, each mobile telephone located in a cell is assigned a unique identification code. A signal having a unique identification code is generated for identifying each mobile telephone located in a cell. Hence, the step corresponds to the claimed step of generating a plurality of time-varied signals. The generated signal having a unique identification code is a time-varied signal as appreciated by those skilled in the art.

All signals are coupled to the zones in the cell. The signal coupled to the zones is delayed so that the transmission of the signal among a plurality of antenna sets is delayed by a pre-selected amount so as to reduce interference caused by successive reception of signals by the mobile telephone located in the cell. In light of the aforementioned teachings, each signal having a unique identification code is delayed by a pre-selected amount, corresponding to the claimed step of inserting a time delay between two time-varied signals.

Lee does not expressly disclose a received signal quality measurement satifying a received signal quality criterion as claimed. Nevertheless, Lee teachings express the signal is delayed by a pre-selected amount so as to reduce interference caused by successive reception of signals by the mobile telephone located in the cell. In light of that it would have been obvious for one of ordinary skill in the art that the amount of delay is a result of a received signal measurement at each mobile telephone and the amount of acceptable interference corresponds to the claimed received signal quality.

Regarding claim 20, as recited in claim 18, the signal is delayed by a pre-selected amount so as to reduce interference caused by successive reception of signals by the mobile telephone located in the cell. In light of that, it would have been obvious for one of ordinary skill in the art that the pre-selected amount of delay is directly related to a signal quality threshold as claimed in the pending application.

Regarding claim 21, the pre-selected amount of delay is equivalent to a delay code element in the simplest form as disclosed in the original disclosure.

Regarding claims 23 and 47, said claim is rejected on the same ground as claim 18. Furthermore, a code element of a time-varying code is, in its simplest form, a period of time appended before or after a time-varied signal. Because the pre-selected amount of delay for each mobile telephone in the cell may be different, a characteristic of the signals is varied according to the pre-selected amount of delay. In light of that, the pre-selected amount of delay specifies a characteristic of a plurality of the signals having unique identification, corresponding to the claimed time-varying code specifying a characteristic of a plurality of time-varied signals.

Regarding claims 24 and 48, a mobile telephone located in the cell receives signals separated by a pre-selected amount of delay. Therefore, the time delay is equivalently inserted between two delay periods, corresponding to the claimed step of specifying time delays to be inserted between two delay code periods.

Regarding claims 25 and 49, as recited in claim 18, the pre-selected amount of delay is based on the amount of interference caused by successive reception of signals by the mobile telephone located in the cell. Even though Lee teachings do not expressly disclosed the claimed steps as set forth, it would have been obvious for one of ordinary skill in the art that a mobile telephone would measure a received signal based on some original time delay, selects a measurement satisfying a received signal quality criterion (amount of acceptable interference), and delay the transmission of signal by determined amount of delay, corresponding to the sum of the time delays .

Regarding claims 26 and 50, interference measurement is directly related to signal strength.

Regarding claims 27-28, and 51-52, an amount of delay is inserted when the interference level falls below a threshold at the mobile telephone as appreciated by one of ordinary skill in the art.

Regarding claim 35, the claimed one code element as defined in the original disclosure is just a period of time appended before or after in its simplest form. In light of that, the pre-selected amount of delay is equivalent to the claimed code element comprising a time delay value.

***Allowable Subject Matter***

5. Claims 11-16 are allowed.

Regarding claim 11, said claim is allowed because the prior art of record does not teach or suggest "*wherein at least one delay code is generated using at least one of: a designed code generation technique, and a pseudorandom code generation technique* ".

6. Claims 29-34 are allowed.

Regarding claim 29, said claim is allowed because the prior art of record does not teach or suggest "*wherein at least one delay code is generated using at least one of: a designed code generation technique, and a pseudorandom code generation technique* ".

7. Claims 38-43 are allowed.

Regarding claim 38, said claim is allowed because the prior art of record does not teach or suggest "*wherein the time position is specified in accordance with a code element of a time-hopping code* ".

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 703-305-2384. The examiner can normally be reached on Tuesday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

JEAN B. CORRIELUS
PRIMARY EXAMINER
7/8/04